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(21) International Application Number: PCT/IL99/00272 (22) International Filing Date: 20 May 1999 (20.05.99) (30) Priority Data: 60/086,261 21 May 1998 (21.05.98) US (71) Applicant (for all designated States except US): BIO-SEAL LTD. [IL/IL]; Sarah Dickstein, Raziell Street 26, 52244 Ramat-Gan (IL). (72) Inventors; and (75) Inventors/Applicants (for US only): <u>INGMAN, Dov</u> [IL/IL]; Haim Hazaz 3/55, 34996 Haifa (IL). <u>DICKSTEIN, Sarah</u> [IL/IL]; Raziell Street 26, Ramat-Gan (IL). <u>OGENKO, Vladimir</u> [UA/UA]; Palladin Prospect, 24/8, Kiev, 252142 (UA). <u>CHUIKO, Alexei</u> [UA/UA]; Kostelna Street, 15/37, Kiev, 252001 (UA). (74) Agent: LANGER, Edward; P.O. Box 410, 43103 Raanana (IL).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: MULTI-ACTION PARTICLE FOR STRUCTURING BIOLOGICAL MEDIA**(57) Abstract**

A method for altering the surface structure of ultra-disperse particles to allow predetermined interactions to take place in biological media. In a preferred embodiment of the invention, an ultra-disperse particle is subjected to particle modification, allowing the building of structures on the surface of a basically spherical particle so as to direct its interactions. The inventive method allows the building of protrusions of different shapes and different branching patterns, bonding of different chemicals and changing of electronic structure of the surface on the basically spherical particle. Particle modification enables the formation of layers allowing sequential actions to be performed by the particle, or modification can create more than one type of interactive surface on each particle allowing different interactions to occur simultaneously. These modified particles have applications, for example, as pharmaceuticals, cosmetics, preservatives, and in many other fields. Water-oil emulsions can be created for use in skin creams and other cosmetic and food industry applications. The particles can be used in many applications involving radiation to reduce the level of radioactivity necessary, thereby lowering exposure. The particles have the ability to structure biological media by creating a three-sided biological system comprising a biological tissue, the particle and the surrounding liquid.

